

mechanical force, as is the case when vegetable parasites make their way through the cell-membranes of *Confervæ* or other plants. Besides this, it deserves also to be remembered that nearly all the parasites here spoken of occur in marine animals.

In concluding this notice, I may further mention that these parasites afford an excellent means for demonstrating the *double-refracting power* of the shells of the several genera mentioned in this communication. I was first struck with this fact in examining a horizontal section of *Lima scabra* obtained from Dr. Carpenter, and finding that many tubuli appeared double. In following this matter, it was easy to show that all the tubuli running in a certain direction, and in an oblique way through the section, appeared simple at the upper surface of it, and became double in the inferior layers, so that the distance of the two images increased with the shortening of the focus. When the preparation was inverted, the reverse was the case. The same phenomena as in *Lima* were also observed in *Anomia*, *Ostrea*, *Murex truncatus*, *Turbo rugosus*, *Tritonium cretaceum*, and *Balanus*, the shells of which animals have therefore all such a structure that they refract the light in the same way as the well-known double-refracting crystals*.

ZOOLOGICAL SOCIETY.

January 11, 1859.—Dr. Gray, F.R.S., V.P., in the Chair.

NOTES ON THE "MOORUK" (CASUARIUS BENNETTII).

BY GEORGE BENNETT.

On the 26th of October 1858, the 'Oberon' cutter of forty-eight tons arrived in Sydney, having two fine young specimens of the "Mooruk" on board, stated to be male and female. On going on board I found them confined in a very small space; and the Captain informed me he had had them eight months, that he procured them soon after his arrival at New Britain for Sydney, and since that time had been trading about the islands, having these birds on board; they were fed principally upon yams. I observed they were in poor condition, but healthy in appearance, and plumage in good order. They were about half the size of the specimen sent to England; but one, apparently the male bird, appeared a little larger than the other. Captain Devlin informs me that the natives capture them very young, soon after they are hatched, and rear them by hand. The natives rarely or never can capture the adult bird, as they are so very shy and difficult of approach—the native weapons being ineffectual against so rapid and wary a bird. These birds are very swift of foot, and possess great strength in the legs; on the

* According to Brewster (Bibl. Univ. de Genève, 1836, ii. 182), who seems the only person who has hitherto observed the double-refracting power of a shell, viz. of the mother-of-pearl, that shell (*Meleagrina*) shows the same phenomena as the double-axed double-refracting Arragonite,—on which question I am not as yet able to give an opinion.

least alarm they elevate the head, and, seeing danger, dart among the thick brush, and thread about in localities where no human being could follow them, and disappear like magic. This bird, with its strong legs and muscular thighs, has an extraordinary power of leaping: it was from this circumstance the first bird brought from New Britain was lost: from its habit of leaping, it one day made a spring on the deck and went overboard; as it was blowing a strong breeze at the time, the bird perished. In warm weather, the Captain informs me, they are fond of having a bucket of salt water thrown over them, and seem to enjoy it very much. I succeeded in purchasing these birds; and Captain Slater (the present commander of the 'Oberon') brought them to my house in a cab; and when placed in the yard, they walked about as tame as turkeys. They approached any one that came into the yard, pecking the hand as if desirous of being fed, and were very docile. They began by pecking at a bone in the yard, probably not having tasted any meat for some time, and would not, while engaged upon it, touch some boiled potatoes which were thrown to them; indeed we found afterwards they fed better out of a dish than from the ground—no doubt, having been accustomed early to be fed in that manner. They were as familiar as if born and bred among us for years, and did not require time to reconcile them to their new situation, but became sociable and quite at home at once. We found them next day rather too tame, or, like spoilt pets, too often in the way. One or both of them would walk into the kitchen; while one was dodging under the tables and chairs, the other would leap upon the table, keeping the cook in a state of excitement; or they would be heard chirping in the hall, or walk into the library in search of food or information, or walk up stairs, and then be quickly seen descending again, making their peculiar chirping, whistling noise; not a door could be left open, but in they walked, familiar with all. They kept the servants constantly on the alert: if the servant went to open the door, on turning round she found a "Mooruk" behind her; for they seldom went together, generally wandering apart from each other. If any attempt was made to turn them out by force, they would dart rapidly round the room, dodging about under the tables, chairs, and sofas, and then end by squatting down under a sofa or in a corner; and it was impossible to remove the bird, except by carrying it away: on attempting this, the long, powerful, muscular legs would begin kicking and struggling, and soon get released, when it would politely walk out of its own accord. I found the best method was to entice them out, as if you had something eatable in the hand, when they would follow the direction in which you wished to lead them. They sometimes also give a smart kick to any person attempting to turn them out forcibly. The housemaid attempting to turn the bird out of one of the rooms, it gave her a kick and tore her dress whilst she was very politely driving him before her. They walk into the stable among the horses, poking their bills into the manger. When writing in my study, a chirping, whistling noise is heard; the door, which was ajar, is pushed open; and in walk the "Mooruks," who quietly pace round the room, in-

specting everything, and then as peaceably go out again. If any attempt is made to turn them out, they leap and dodge about, and exhibit a wonderful rapidity of movement, which no one would suppose possible from their quiet gait and manner at other times. Even in the very tame state of these birds, I have seen sufficient of them to know that, if they were loose in a wood, it would be impossible to catch them, and almost as difficult to shoot them. One day, when apparently frightened at something that occurred, I saw one of them scour round the yard at a swift pace, and speedily disappear under the archway so rapidly that the eye could hardly follow it, upsetting all the poultry in its progress, as they could not get out of the way. The lower half of the stable-door, about 4 feet high, was kept shut to prevent them going in; but this proved no obstacle, as it was easily leaped over by these birds. They never appeared to take any notice of, or be frightened at, the Jabiru or Gigantic Crane, which was in the same yard, although that sedate, stately bird was not pleased at their intrusion. One day I remarked the Jabiru spreading his long wings, and clattering his beak, opposite one of the "Mooruks," as if in ridicule of their wingless condition. "Mooruk," on the other hand, was pruning its feathers and spreading out its funny little apology for wings, as if proud of displaying the stiff horny shafts with which they were adorned. The "Mooruks" often throw up all their feathers, ruffling them; and then they suddenly fall flat as before: they appear to have great power in raising all the feathers; and the wings are used to aid them in running, but never seem used for defence. Captain Devlin says, the natives consider them to a certain degree sacred, and rear them as pets; he is not aware that they are used as food, but if so, not generally; indeed their shy disposition and power of rapid running, darting through the brake and bush, would almost preclude their capture. It reminds me (from the description) of the habits of the *Menura*, or Lyre-bird of Australia; only it is much larger and more powerful in its actions. The natives carry them in their arms, and are very kind to and have a great affection for them; this will account for their domesticated state with us.

The noise of these birds, when in the yard, resembled that of the female Turkey; at other times the peculiar chirping noise was accompanied by a whistling sound also. The contrast of these birds with the Jabiru was very great. The "Mooruks" were sometimes moving about like the female Turkey in rapid motion or excitement, or, when walking quietly, always inquisitive and poking their beaks into everything and familiar with every person. The Jabiru, on the other hand, was a perfect picture of sedate quietness, looking upon all play as injurious to his constitution or derogatory to his dignity, remaining stiff in his gait and serious in his demeanour.

Only one egg was brought, and that was partly broken; I have it in my possession. The Captain informs me that they can be procured from the natives, and have generally a hole in them about the size of a shilling, through which the contents have been extracted.

The height of the largest or male bird, to the top of the back, wa

2 feet 2 inches, and of the female 2 feet. The height of the largest or male bird, when erect, to the top of the head, was 3 feet 2 inches, and of the female 3 feet.

DESCRIPTION OF THE ADULT STATE OF *VOLUTA MAMILLA*,
GRAY. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

We have had in the British Museum for years a young specimen of a shell from Van Diemen's Land, which I named *Voluta mamilla*. It is figured under that name in Sowerby's 'Conchological Thesaurus,' t. 50. f. 57, 58; it is described by me in my "Observations on the Species of Volutes," Proc. Zool. Soc. 1855, p. 55, under the name of *Scapha mamilla*; and it is noticed under the genus *Cymbium* by the Messrs. A. and H. Adams, in their 'Genera of Mollusca.'

But many conchologists have been inclined to regard this specimen as a mere monstrosity of some other species,—an idea that could only have been entertained by such as were ignorant of the general structure and physiology of molluscous animals.

We have lately received from Van Diemen's Land three fine specimens of this shell,—two of them fully grown, and the other intermediate in size between the young specimen we formerly possessed and the adult state of the species. It may be observed that these shells were all taken while the animals were growing; the shells have consequently the thin edge incident to that state of the animal, and not the rounded thickened edge to the outer lip which the shell assumes while it is in a state of rest after its former growths. Though probably the full size of the species, they are none of them what conchologists generally call adult shells. But this form of the outer lip is no proof of the adult state of the shell; for the animal constantly increases the size of the shell after such thickening and periods of rest; thus the thickening of the edge of the lip is only a proof that the shell was taken and the animal destroyed while the animal and shell were not increasing their size.

The adult shell greatly resembles *Scapha magnifica* in form and colouring; but the apex is much larger, irregular, with the apex of the whorl on one side of the tip; and the system of colouring is much broader, and coarser in its character.

SCAPHA MAMILLA.

Shell ovate; nucleus very large, spire rather irregular, one-coloured, orange, with the apex on one side; the last whorl irregularly marked with dark purple-brown lines having triangular pale spots, and with a subcentral and broad posterior sutural colourless band. Pillar dark orange, with three oblique plaits. Throat yellow.

This form of the nucleus is found in another species of the genus *Scapha*, but not in such a highly developed state, viz. in *Scapha fusiformis*, also inhabiting Van Diemen's Land; and it is also found in the genus *Fulgoraria*.

Several conchologists, for example the Messrs. Adams, have supposed that this shell, on account of the size of the nucleus, ought to be referred to the genus *Cymbium*, which is characterized by having an irregular callous tip to the nucleus; but if the nucleus of *V. mamilla* is properly examined, it will be found that it is distinctly spiral, but has the apex of the first whorl of the nucleus excentric or bent on one side; and this is not very uncommon in several species of *Chrysostoma* and *Fusus*, &c.

The species of *Scapha* may be thus divided, according to the form and surface of the whole of the nucleus:—

I. *Spire of nucleus regular, with a central apex.*

a. *Nucleus large; whorls crenulated near the suture.*

S. vesperilio.

S. rutila.

S. nivosa.

S. magnifica.

S. Sophia.

b. *Nucleus large; whorls smooth.*

S. aulica.

S. leucostoma.

S. Deshayesii.

c. *Nucleus moderate or small; spire often subcylindrical, generally truncated or deciduous.*

S. punctata.

S. Ferussacii.

S. colocynta.

S. pacifica.

S. magellanica.

S. concinna.

S. javanica.

II. *Spire of nucleus rather irregular; the apex excentric, lateral.*

S. fusiformis, apex moderate.

S. mamilla, apex very large.

NOTICE OF NOTOPTERIS, A NEW GENUS OF PTEROPINE BAT FROM THE FEEJEE ISLANDS. BY DR. J. E. GRAY, F.R.S., ETC.

Among a large collection of the skins of Mammalia, Birds, Fishes, Crustacea, &c., sent to the British Museum by the Lords of the Admiralty, which were collected by Mr. Rayner, Dr. Macdonald, and the Medical Officers of H.M. Ship 'Herald,' during the voyage to the Feejee and other Pacific Islands, under the direction of Captain Denman, R.N., there are two specimens of a small Pteropine Bat from the island of Viti, which has the elongated face and the general appearance of the *Kiodote* (*Macroglossus*), but is provided with an elongated, free, slender, tapering tail, nearly as long as the hind legs, which, like the tail of most Bats having this member enclosed in the interfemoral membrane, is arched, the tip being bent ventrally or downwards.

Considering that the best genera of Bats are those established on the external conformation of the members, I am inclined to propose for this animal a new generic designation; and I have no doubt that,

when its habits and manners are known, they will be found to differ considerably from those of *Macroglossus* and *Cephalotes*, to which it is most nearly allied.

NOTOPTERIS.

Head elongate; muzzle produced, subcylindrical; nose simple, muffle narrow, bald between the nostrils, with a deep central notch. Ears small, lateral. Body covered with rather crisp hair. Wings broad, short, arising from the middle of the back, bald, only separated by a very narrow line of hair down the vertebral line, and with soft hair on the under side near the body. Thumb elongate; lower joint half the length of the upper, and enclosed in a web. The index-finger, of three bony joints; the last joint short, clawless. Interfemoral membrane deeply cut out, fringing the hind legs to the heel, hairy above and on the under side near the body, bald at other parts. Tail elongate, slender, tapering, many-jointed, arising from, and with the base attached to, the under side of the narrow interfemoral membrane; as long as the hind legs. The skull elongate, produced and slender in front.

Cutting teeth $\frac{1-1}{1-1}$; canines $\frac{1-1}{1-1}$; grinders $\frac{4-4}{5-5}$.

The cutting teeth conical, far apart; the upper are very small, rudimentary, on the middle of the intermaxillary bone between the end of the nose and the canine teeth; the lower rather larger, conical, blunt, separated from each other by a broad lunate space near the front edge of the canine teeth; canine larger, grooved; grinders compressed, blunt.

The upper cutting teeth are conical, small, far apart, placed on the middle of the slender produced intermaxillary bones, which have a small depression near the anterior extremity, like a cavity, whence a second chisel-shaped tooth might be developed; but as there is no appearance of the tooth in either of the skulls, perhaps it may be where a tooth of this kind has been shed.

The lower teeth are small and blunt, placed near the front of the base of the canine tooth. The edge of the front of the jaw between these teeth is rather produced and sharp-edged, and is nicked near the cutting tooth, giving the jaw somewhat the appearance of a second tooth, but it is not enamelled.

The canines elongate, conical, acute, curved.

The grinders are reniform, compressed, gradually diminishing in size towards the back of the jaws; the front one on each side in each jaw is largest, higher than the rest, and crenated on the crown; the rest have a flat smooth crown.

The tongue was not preserved; but, from the form of the muzzle and of the cutting teeth, I think it is very probably elongate, like that of the genus *Macroglossus*.

In the absence of the claw on the index-finger, this animal agrees with the genus *Cephalotes* from Timor, as it also does with the account of the wings and the teeth given in the systematic works; but it differs from that genus very essentially when the specimens

of the two animals are compared. The head of *Cephalotes* is much shorter and broader. The cutting teeth are exceedingly different: in *Cephalotes* the cutting teeth are close together, the upper ones chisel-shaped, the lower ones rather conical, entirely filling up the very narrow space between the base of the large canines; while in *Notopteris* they are only two, far apart, small and isolated.

The wings of the two genera arise from the centre of the back; and the bases of the wings, which cover the back, are naked. But in *Cephalotes* the nakedness extends over the shoulders to a line even with the front edge of the wings; in *Notopteris* the naked part only occupies the hinder half of the back or loins, the shoulders being exposed and covered with hair like the rest of the body.

The tail in *Cephalotes* is short and rudimentary, flattened, and formed of four or five very short joints, and not elongated and incurved as in the new genus.

I may observe that, though the index-finger of the *Cephalotes Peronii* from Celebes (in the British Museum, received from the Leyden Collection) is not provided with any distinct, well-developed claw, the end of the bone is curved upwards and rather produced into a resemblance of a claw,—there being no indication of such an appendage in the animal from Viti.

Pteropus amplexicaudatus, from Timor, has a rather elongated head, a short free tail; and the wings arise from the sides of the back, with a broad hairy space between their bases; but this differs from *Cephalotes* in having a small distinct claw on the end of the index-finger, and in having four chisel-shaped cutting teeth in the lower jaw, occupying the whole of the rather wide space between the base of the large canines; and it has four rather conical cutting teeth in the upper jaw.

NOTOPTERIS MACDONALDII.

Pale-reddish brown above, rather grayer beneath; the hinder half of the back, which is covered by the bases of the wings, bald, with a very narrow line of short hair down the vertebral line. The rump and upper surface of the base of the interfemoral membrane covered with hair.

Hab. The Island of Viti Leon, Feejees. September 1857. Male and female. Iris dark hazel. (*John D. Macdonald.*)

Male. Length of head and body $4\frac{1}{2}$, tail 2, fore-arm bone $2\frac{1}{4}$, leg bone $1\frac{1}{8}$ inch.

Female rather smaller: arm-bone $2\frac{1}{8}$ inches.

NOTICE OF A NEW GENUS OF LOPHOBRANCHIATE FISHES FROM WESTERN AUSTRALIA. BY DR. J. E. GRAY, F.R.S., ETC.

Among the collections made by the Medical Officers of H.M.S. 'Herald,' above referred to, is a curious and apparently new species of *Syngnathidæ*, of which I give a brief description.

HALIICHTHYS.

Mouth elongate, quadrangular, with a spine on the middle of each

side of the upper edge. Body six-sided. Tail quadrangular. The shields of the head and body with a more or less elongated spine, each ending in a very long slender filiform beard. Under side of body and tail flat, with a very slightly raised central ridge. Pectoral and dorsal fin distinct. Caudal fin none, or very rudimentary. Egg-pouch — ? ; none apparent in the specimen.

HALIICHTHYS TÆNIOPHORA.

The head compressed, spinose, with a high, arched, central ridge armed with spines, each having an elongated slender filiform beard in front of its base ; the eye-brows produced, crested, with two large curved spines on the upper edge ; the front spine furnished with a very long filiform beard on the front edge ; the lower edge of the orbit with two spines, the base of the operculum with one, and the upper edge with a prominent ridge armed with two unequal spines, the hinder one largest and compressed. The head at the back edge of the operculum with an arched ridge armed with four large compressed conical spines ; and there is a compressed bifid one on the nape between these two arched ridges. Body hexangular, or subheptangular from the obscure ventral keel, formed of nineteen rings ; the lower lateral angles are narrower than the rest, which are subequal ; each plate of the rings is armed with a subcentral spine ; and the spines on the three or four darker rings of the body are furnished with elongated filiform beards. The tail is quadrangular ; the under side is rather the widest and flat, the others are concave ; each shield is furnished with a spine like those of the body, and the greater part of the spines are furnished with a filiform elongated beard. Caudal rings about forty-five, the apical one obscure. Dorsal fin over the vent 26-rayed.

The dry fish is black above, pale beneath, with three distant black spots on each side of the body, and distant black cross bands on the under side of the base of the tail.

Hab. Freycinet harbour, Shark's Bay, W. Australia.

Mr. Gould read the following extract from a Letter addressed to him by George Bennett, Esq., of Sydney, dated October 15th, 1858 :—

“The semipalmated Goose, I have seen domesticated in Sydney in a poultry-yard, having been hatched by a common hen. This bird in its anatomy evidently approaches the Cranes, and in habits also. Especially when you see it running about the poultry-yard, it resembles one of the *Gruidæ* more than a Goose. The bird I allude to was one of many hatched under a hen from eggs procured from the blacks at a station on the Mooruya River, near Broulee, south of Sydney. Ten eggs were procured and placed under two hens, five for each, and in three days less than a month produced seven young Geese, which were reared by the foster-mother. The eggs are said to be cream-coloured, not larger than a small-sized goose-egg. The birds lay their eggs close to the water in the lagoons ; they commence to lay about September. The bird was an adult, and

differed materially from your drawing, which I consider to represent either a distinct species or, from the peculiarity of the bill and feet, a bird of the first year. The bill, feet, and legs were of a *flesh-colour*; the plumage of the head, neck, wings, centre of the back, tail, and thighs glossy-black; remainder of the plumage white. These birds are readily domesticated, and run about the poultry-yard in the most amicable manner possible. The beak, feet, and legs were of the same colour when hatched; and the bird, dating from the time it was brought forth, would be one year and eight months old."

MISCELLANEOUS.

Obituary Notice.—ARTHUR HENFREY, F.R.S. &c.

It is with the most painful feelings that we have to announce to our readers the death of Professor Arthur Henfrey, which took place on the 7th of September, at the age of thirty-nine. In the prime of life, in the fulness of his intellectual vigour—with the great battle of fame, the life-struggle of the professional man of science, nobly fought and won—with the rewards of his persevering and conscientious exertions within his grasp,—this great and gentle spirit has passed from the scene of his labours, leaving a mournful void in the affections of his personal friends, and casting a blight over those expectations which every one must have formed for him, of a brilliant and useful career in the department of science to which he had devoted himself.

Professor Arthur Henfrey was born at Aberdeen, of English parents, on the 1st of November, 1819. He studied medicine at St. Bartholomew's Hospital, where he was a great favourite with his teacher, Dr. Frederick Farre. On leaving the Hospital, in 1843, when he became a member of the Royal College of Surgeons, the delicate state of his health, arising from a tendency to bronchial affections which adhered to him throughout his life, prevented him from the practice of his profession; and from that time he devoted himself exclusively to the study of Botany, in which science he had already acquired great proficiency; and by a course of unremitting diligence in investigation, he speedily placed himself in the foremost rank of English botanists. In the year 1847 he was appointed Lecturer on Botany at the St. George's Hospital School of Medicine, and in 1854 succeeded the late Professor Edward Forbes in the Botanical chair at King's College. This position he retained until his death, and in the course of the last few years added to it the offices of Examiner in Natural Science at the Royal Military Academy and to the Society of Arts. At the same time his labours were incessant, both in botanical observation and in